CLAIMS

1. A phase measurement device that measures an output from a circuit to be measured upon feeding an input signal having at least two input frequency components to the circuit to be measured, comprising:

a phase acquisition section that acquires phases of the input frequency components and a distortion component based upon a local frequency;

a match time measurement means that measures a match time at which the phases of the input frequency components match each other based upon an acquired result of said phase acquisition section; and

a distortion component phase measurement means that measures a phase of the distortion component at the match time based upon an acquired result of said phase acquisition section,

wherein the distortion component includes at least either of a high frequency distortion component that has a frequency higher than the input frequency components, and a low frequency distortion component that has a frequency lower than the input frequency components, and

said phase acquisition section acquires both or either of a highest frequency component and a lowest frequency component of the input frequency components, and a phase of the high frequency distortion component or the low frequency distortion component.

2. The phase measurement device according to claim 1, wherein said phase acquisition section comprises:

an orthogonal transformation means that orthogonally transforms the output from the circuit to be measured by means of the local frequency; and

a phase acquisition means that acquires the phases of the input frequency components and the distortion component in outputs from said orthogonal transformation means.

3. The phase measurement device according to claim 2, wherein said phase acquisition section acquires

the phases of the highest frequency component and the lowest frequency component of the input frequency components, and the phase of the low frequency distortion component, and

the phases of the highest frequency component and the lowest frequency component of the input frequency components, and the phase of the high frequency distortion component.

4. The phase measurement device according to claim 3, comprising a local frequency setting means that sets the local frequency,

wherein said local frequency setting means sets the local frequency both

to an average of the lowest frequency of the distortion components and the highest frequency of the input frequency components, and

to an average of the highest frequency of the distortion components and the lowest frequency of the input frequency components.

5. The phase measurement device according to claim 2, wherein said phase acquisition section acquires

the phases of the lowest frequency component and the highest frequency component of the input frequency components,

the phase of the lowest frequency component of the input frequency components and the phase of the low frequency distortion component, and

the phase of the highest frequency component of the input frequency components and the phase of the high frequency distortion component.

6. The phase measurement device according to claim 5, comprising a local frequency setting means that sets the local frequency,

wherein said local frequency setting means sets the local frequency

to an average of the lowest frequency and the highest frequency of the input frequency components,

to an average of the lowest frequency of the distortion component and the lowest frequency of the input frequency component, and

to an average of the highest frequency of the distortion component and the highest frequency of the input frequency component.

7. The phase measurement device according to claim 5 or 6, comprising:

a phase change quantity acquisition means that acquires a phase change quantity of the highest frequency component or the lowest frequency component of the input frequency components which has changed due to a change of the components for which the phase acquisition section acquires the phases each time of the change; and

a distortion component phase compensation means that corrects the measurement result of said distortion component phase measurement means based upon the phase change quantity.

8. The phase measurement device according to claim 2, wherein said phase acquisition section acquires

the phases of the highest frequency component and the lowest frequency component of the input frequency components, and

the phase of the lowest frequency component of the input frequency

components and the phase of a neighboring low frequency distortion component which is a part of the low frequency distortion components, and

acquires the phase of a low frequency distortion component whose phase has already been acquired and the phase of a low frequency distortion component whose frequency is lower than that of the low frequency distortion component until the acquisition of the phase of the distortion component at the lowest frequency.

9. The phase measurement device according to claim 2, wherein said phase acquisition section acquires

the phases of the highest frequency component and the lowest frequency component of the input frequency components, and

the phases of the highest frequency component of the input frequency components, and the phase of a neighboring high frequency distortion component which is a part of the high frequency distortion components, and

acquires the phase of a high frequency distortion component whose phase has already been acquired and the phase of a high frequency distortion component whose frequency is higher than that of the high frequency distortion component until the acquisition of the phase of the distortion component at the highest frequency.

10. The phase measurement device according to claim 8 or 9, comprising a local frequency setting means that sets the local frequency,

wherein, upon the phase acquisition, said local frequency setting means sets the local frequency to an average value of the maximum value and the minimum value of the frequency of the signals for which the phases are acquired.

11. The phase measurement device according to claim 8 or 9, comprising:

a phase change quantity acquisition means that acquires a phase change quantity of a distortion component which has changed due to a change of the components for which the phase acquisition section acquires the phases each time of the change; and

a distortion component phase compensation means that corrects the measurement result of said distortion component phase measurement means based upon the phase change quantity.

12. The phase measurement device according to claim 1, wherein said phase acquisition section comprises a discrete Fourier transform means that carries out discrete Fourier transform.

13. The phase measurement device according to claim 1, comprising a display means that displays a vector whose angle is the phase of the distortion component, and whose length is the amplitude of the distortion component.

14. The phase measurement device according to claim 13, wherein said display means displays a vector whose length is a logarithm of the amplitude of the distortion component.

15. A phase measurement method of measuring an output from a circuit to be measured upon feeding an input signal having at least two input frequency components to the circuit to be measured, said method comprising:

a phase acquisition step of acquiring phases of the input frequency components and a distortion component based upon a local frequency;

a match time measurement step of measuring a match time at which

the phases of the input frequency components match each other based upon an acquired result of said phase acquisition step; and

a distortion component phase measurement step of measuring a phase of the distortion component at the match time based upon an acquired result of said phase acquisition step,

wherein the distortion component includes at least either of a high frequency distortion component that has a frequency higher than the input frequency components, and a low frequency distortion component that has a frequency lower than the input frequency components, and

said phase acquisition step acquires both or either of a highest frequency component and a lowest frequency component of the input frequency components, and a phase of the high frequency distortion component or the low frequency distortion component.

16. A program of instructions for execution by the computer to perform a phase measurement process of a phase measurement device that measures an output from a circuit to be measured upon feeding an input signal having at least two input frequency components to the circuit to be measured, having a phase acquisition section that acquires phases of the input frequency components and a distortion component based upon a local frequency, said phase measurement process comprising:

a match time measurement step of measuring a match time at which the phases of the input frequency components match each other based upon an acquired result of said phase acquisition section; and

a distortion component phase measurement step of measuring a phase of the distortion component at the match time based upon an acquired result of said phase acquisition section,

wherein the distortion component includes at least either of a high

frequency distortion component that has a frequency higher than the input frequency components, and a low frequency distortion component that has a frequency lower than the input frequency components, and

said phase acquisition section acquires both or either of a highest frequency component and a lowest frequency component of the input frequency components, and a phase of the high frequency distortion component or the low frequency distortion component.

17. A computer-readable medium having a program of instructions for execution by the computer to perform a phase measurement process of a phase measurement device that measures an output from a circuit to be measured upon feeding an input signal having at least two input frequency components to the circuit to be measured, having a phase acquisition section that acquires phases of the input frequency components and a distortion component based upon a local frequency, said phase measurement process comprising:

a match time measurement step of measuring a match time at which the phases of the input frequency components match each other based upon an acquired result of said phase acquisition section; and

a distortion component phase measurement step of measuring a phase of the distortion component at the match time based upon an acquired result of said phase acquisition section,

wherein the distortion component includes at least either of a high frequency distortion component that has a frequency higher than the input frequency components, and a low frequency distortion component that has a frequency lower than the input frequency components, and

said phase acquisition section acquires both or either of a highest frequency component and a lowest frequency component of the input

frequency components, and a phase of the high frequency distortion component or the low frequency distortion component.